Sulfur and molybdenum fractionation in marine and riverine alluvium paddy soils

ABSTRACT

Intermittently submergence and drainage status of paddy fields can cause alterations in morphological and chemical characteristics of soils. We conducted a sequential fractionation study to provide an insight into solubility of Sulfur (S) and Molybdenum (Mo) in flooded alluvial paddy soils. The samples (0-15 and 15-30 cm) were taken from marine and riverine alluvial soils in Kedah and Kelantan areas, respectively, and were sequentially extracted with NaHCO3, NaOH, HCl, and HClO4-HNO3. Total S in upper and lower layers of Kedah and Kelantan ranged between 273 and 1121 mg kg-1, and 177 to 1509 mg kg-1, respectively. In upper layers and subsoil of Kedah, average total Mo were 0.34 and 0.27 mg kg-1, respectively. Average total Mo in Kelantan were 0.25 mg kg-1 (surface layer) and 0.28 mg kg-1 (subsoil). Cation exchange capacity (CEC) was positively correlated with plant available amounts of Mo in upper layers of Kedah area. Also, total and medium-term plant-available S was correlated with total carbon (C) at lower layers of Kelantan soil series. But in surface layers of Kelantan soil series, CEC was strongly correlated with total and medium-term plant-available S. Our results indicates that the influence of flooding conditions on soil S and Mo contents in paddy fields may cause long-term changes in S and Mo chemical reactivities.

Keyword: Alluvial soil; Molybdenum; Paddy; Sulfur